Music, Sociality, and Digital Technology

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Digital technology can be used to amplify the wonderful benefits of music.

A strange set of coincidences provoked me into writing this particular essay. Having enjoyed listening to music all my life, including having sung a bit in my youth, and being an avid reader of Oliver Sacks' books on neuroscience, I recently bought a copy of his *Musicophilia: Tales of Music and the Brain* (nybooks.com/articles/21059 offers an excellent review and summary).

While reading this book one morning, with the local classical radio station playing in the background, I realized that Graham Abbott, the presenter (abc.net.au/classic/keys), was talking with someone about Norman Weinberger and his research into what is sometimes called neuromusic (128.200.122.84/weinberger), linking this to the profound benefits of music in early education. Their discussion made me think of my own essay, "Supporting the Acquisition of Basic Skills" (The Profession, Mar. 2008, pp. 104, 102-103).

A few days later, the July/August issue of *Scientific American Mind* arrived in the mail with an article—"Why Music Moves Us" (tinyurl.com/l64rrp)—by Karen Schrock, derived partly from Sacks' book, that commented on the relationship between language and music. The provocation was irresistible.

MUSIC AND LANGUAGE

Music is remarkable in that its perception or performance involves much more of the human central nervous system than other kinds of perceptions or actions. This is dramatically illustrated in the great variety of musical phenomena caused by different neural malfunctions, as described in Sacks' book. It is also being borne out by neurological studies using functional magnetic resonance imaging.

Musical primacy

The deep embedment of music in the human brain implies that music is somehow more fundamental than other conscious mental activity. Oliver Sacks describes the case of English musician Clive Wearing, who lost the ability to store new or retrieve old memories when a disease struck his brain (tinyurl.com/289kyp). He lived only in the present moment, a tragic fate.

I remember clearly the strong pathos of Jonathan Miller's 1986 BBC documentary on Wearing's condition, *Prisoner of Consciousness*, and his startling transformation when put in front of his choir as conductor. As a conductor he was as competent as he would have been before the disease, but as soon as he finished conducting, he fell back into his frightful temporal isolation.

The relationship of language to music is the subject of speculation. In respect to music and neural malfunction, Schrock writes, "Many modern researchers thus conjecture that music evolved by piggybacking on a unique constellation of brain regions dedicated to language, feelings and other functions."

Fusing music and language

Against this, Daniel Everett's study of the Amazonian Pirahã language suggests a relationship quite different from piggybacking. In part two of his book, *Don't Sleep, There Are Snakes* (Random House, 2008), Everett describes some fascinating aspects of what seems to be a simple language with 10 or 11 phonemes, compared to English's 40 or so. But the startling thing about Pirahã is that the phonemes are to a degree interchangeable. Everett unexpectedly discovered this when his informant mixed *t k p* and *x* variously in repeating what was initially "Tí píai," as always meaning "Me too."

Further research showed that Pirahã primarily conveyed meaning

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by pitch and rhythm, allowing the Pirahã "speakers" four channels of discourse beyond what we think of as normal speech: whistle, hum, musical, and yell speech. For example, the Pirahãs use whistle speech when hunting in the jungle, hum speech instead of whispering (which has no pitch), musical speech when praying or dancing, and yell speech for long-distance communication.

Natural languages that added a single musical channel of discourse through whistling (tinyurl.com/96b2w4) or drumming (tinyurl.com/nll7xl) were well known, but Pirahã confounds many theories of linguistics. Curiously, the artificial language Solresol, popular in Europe more than a century ago, had even more channels of discourse than Pirahã, though many of these were much more abstract (tinyurl.com/3gq22k).

The implication of research like Everett's is that musical communication could well have given rise to what we think of as spoken language. Charles Darwin's bicentenary (nature.com/darwin) has perhaps been responsible for the strong recent revival of his suggestion of a musical protolanguage, a suggestion attracting a lot of support from scientists.

EMOTION AND SOCIALITY

What repeatedly arises from research into the psychology and neurology of music are its strong links to emotion. This has many facets. Listening to the singing of Handel's "Ombra mai fù" on the radio just now gave me a kind of abstract emotion much deeper and more personal than I could get from admiring a picture in the local art gallery.

The emotional effects of different kinds of music seem largely independent of cultural background. Schrock cites a variety of research suggesting also that music "elicits a specific emotional response in the brain regardless of personality, taste, or training."

Music as social glue

Perhaps the most significant aspect of music, though, is its sociality. For cultures without radio, television, iPods, and the like, music is thoroughly social. Groups of people bond through singing, dancing, and playing music together. Even in modern Western cultures, going to a concert is an activity emotionally quite different from solo listening to the same music.

Musical experience in early childhood is particularly important to the development of sociality, provided that the experience occurs in a social context.

The sociality of music starts early in life. Mothers croon to their babies and sing lullabies to quiet them or put them to sleep.

In my childhood, making and listening to music was a major part of life. Music pervaded primary school, church, Sunday school, and family social activities. Those who couldn't play the piano—and they were the minority—sang to it. And Saturday night dances were the main purely social event, for young people at least.

Since humans are born with a relatively undeveloped central nervous system, musical experience in early childhood is particularly important to the development of sociality, provided that the experience occurs in a social context. A good demonstration of this is the story of El Sistema in Venezuela (tinyurl.com/nlwjm8). Through its music education of half-a-million young people over the course of 30 years and its development of many youth and children's orchestras, the program has rescued many from poverty and misery. More than a score of other countries are following Venezuela's lead, recently in Scotland for example (tinyurl.com/lf8cx5).

Musical healing

Music can also play an important role in rehabilitation, especially prison inmates. The Singapore Prison Service uses general music education (tinyurl.com/mouwqn), and the dramatic example of a choir in a South African prison was the subject of a recent film (tinyurl.com/mouwqn). Choirs have also been used to rehabilitate people with addictions and mental illness. For example, in Australia there has been The Choir of Hard Knocks and, in the US, the Broe Therapy Choir (broechoir.com).

A social organization, Community Music Victoria, has put together an interesting and compendious website titled "The origins, purpose, function, results and value of music" (tinyurl.com/ngbrgx) that collates research about health and music. This website is useful far beyond health issues, with link-loaded sections: Keywords (96), Individuals (185), Research groups (160), Periodicals and websites (79), Conferences (55), and Books, articles, and reviews (1,992). Unfortunately, the site was the result of a one-off project and has only had a few items added in the two years since it was established.

A musical journey

With these thoughts, I listened to the full ABC music programs I had stumbled upon to get ideas about using digital technology in music education. There are four of these programs that have been stripped of their accompanying music and posted online (as MP3 files), all featuring the trained music educators Graham Abbott and Richard Gill.

The first, *The Body*, mainly explores learning patterns through different kinds of dancing, other rhythmic physical activity, and Dalcroze's eurhythmics (dalcrozeusa.

org). In early education, such activities are physical and social, so there's not much scope for computer-based drill except perhaps through the use of a haptic controller to detect body movement. In later education, there's quite a bit of vocabulary that could be taught, in names of rhythms and dances, while history and geography could be coupled through teaching about folk dances, cultures, and historical dances.

The second, *The Voice*, is about singing, especially in preschool and primary school, and emphasizes the importance of recitation, as of nursery rhymes, as a prerequisite for singing, and of singing as a prerequisite for instrumental music. Here there is great scope for support from computer-administered drill and practice. In early years, miniature computers with an ear microphone can teach recitation and naming and production of intervals, pitches, and rhythms. Keys, harmonies, and musical notation can be well taught by computer-administered drill and practice. Perhaps there's even a future for Solresol here.

The third, *Instruments*, starts by emphasizing that learning to play an instrument is a valuable activity, and not just for someone who wants a musical career. It also stresses that children should learn to compose as well as play. Here there is enormous scope for computer assistance, and not just of the drill and practice kind, which might be used to teach, for example, the sounds, names, and scope of different instruments. The computer can also play compositions, both borrowed and original, and the student can make changes in the notation and listen to the effect of those changes. Again, this must be background to the activity of playing in an ensemble to build both sociality and mind/body coordination.

The fourth, *The Mind*, is in two parts. The first part explains the need to expose children to a variety of musical influences from different times and cultures. Clearly, computers and the World Wide Web could be of considerable use.

The second part refers to Norman Weinberger and focuses on the neurological effects and consequent benefits of music education, its power to develop minds to transfer knowledge and skills across curricular boundaries, and its ability to extend creativity. The concluding observation asserts that good music education depends on having well-trained teachers.

DIGITAL TECHNOLOGY

Modern digital technology has great potential to boost music education, especially in very early education. My essay on using computer-driven drill and practice is highly relevant here. It focused on vocabulary acquisition and numeracy, although using speech technology was alluded to for literacy and second-language training. Leaving out music seems quite a blunder now that I look into it.

However, one point stressed in the earlier essay is just as important for music education: Music drill and practice by computer must always be a background to social musical activity arranged by educators and parents. The great benefit of the computer is that it can impart basic music skill and knowledge that present-day mentors often no longer have because it has faded so much from school and society.

That music education can be used effectively to foster sociality provides the underplayed point in each of these four radio programs. In societies plagued by rampant antisocial behavior, ranging from road rage to street violence to shooting sprees to roadside bombs, education that includes music is surely an important, I would claim essential, countermeasure. Professionals of all kinds, as people with some status in the community and an ethical responsibility to press for social betterment, must work to get this need recognized and adopted as government policy.

Because digital technology has an enormous potential to enhance music education and support teachers and parents in carrying it out—far beyond what I have only superficially suggested in this essay—the computing profession has a clear responsibility to work closely with the teaching profession when—and even before—music education is adopted and pursued politically. C

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